

a speed reducer;

a first member;

a second member connected to the first member through the speed reducer to rotate relative to the first member; and

a motor having a shaft, the motor to drive the second member to rotate relative to the first member, wherein

the speed reducer includes a first-stage speed reducing mechanism and a second-stage speed reducing mechanism,

the first-stage speed reducing mechanism includes an input gear connected directly to the shaft of the motor and spaced from a center of rotation of the speed reducer, a single spur gear in mesh with the input gear,

the second-stage speed reducing mechanism includes a crankshaft connected directly to the spur gear, an external gear which engages the crankshaft to be rocked eccentrically, a casing of the speed reducer, an internal gear which is formed inside the casing and is in mesh with the external gear, and a rotating member which supports the crankshaft for rotation and can rotate around the central axis of the internal gear with respect to the casing,

the casing of the second-stage speed reducing mechanism is attached to the first member,

the second member is attached to the rotating member of the second-stage speed reducing mechanism, and

the motor is attached to the second member, with the shaft of the motor shifted with respect to the center rotation of the speed reducer, so that the input gear of the motor is in mesh with the spur gear of the first-stage speed reducing mechanism.

4. (ONCE AMENDED) A joint structure of a robot, comprising:

a speed reducer comprising:

a cylindrical casing,
a rotating member rotatably supported on the casing through a first bearing and having a hollow in the center thereof, and
a gear speed reducing mechanism arranged on the casing for rotation through a second bearing and having a hollow in the center thereof;
a first member fixed to the casing of the speed reducer and having a hollow in the center thereof;
a second member fixed to the rotating member of the speed reducer and having a hollow in the center thereof; and
a motor fixed to the second member so that the output shaft thereof extends in the direction parallel to the central axis of the speed reducer toward the gear speed reducing mechanism of the speed reducer, the motor having a shaft which is shifted with respect to a center of the speed reducer;
wherein a robot joint is constituted between the first member and the second member in a manner such that the gear speed reducing mechanism of the speed reducer is actuated by the rotation respect to the first member.

5. (ONCE AMENDED) A joint structure of a robot, comprising:

a speed reducer comprising a single spur gear, an input gear to drive the spur gear, and a crank shaft attached to the spur gear and spaced with respect to a center of rotation of the speed reducer;
a first member;
a second member connected to the first member through the speed reducer to rotate relative to the first member; and
a motor having a shaft to drive the input gear connected to the second member to drive the second member.